impregnated, but that a specimen got on the date above mentioned was in preparation to receive the semen.

I recommenced my labours the following year on August 12, and completed them on September 29. These specimens I also forwarded, through my father, to Professor Owen, who found two examples impregnated, one killed on the 30th of August and the other on the 14th of September, a report of which cases he read before the Royal Society in April 1880. Unfortunately, a specimen got on September 15th, which I delayed dissecting until next day, produced a young one during the night, but in the morning was in too decomposed a state to preserve.

It is therefore evident that in this part of Queensland the proper time to get an impregnated specimen of the Echidna with the young in the uterus is in September and October. I was under the impression, through my earlier observations, that the males do not go with the females after the copulating season; but this is not the case; I am sure, however, that after impregnation the females go away by themselves, and do not mix with the males until after the young is born.

I am of opinion that neither the young males or females have any sexual intercourse until their second year, as I have many young males with their testes in a dormant state and young females with the ovaries unexcited. Also, from observation, I am led to believe that the females only breed every second year, as many of my older specimens were not impregnated nor in any way prepared to receive the semen.

3. On the Lizards of the Genera *Lacerta* and *Acanthodactylus*. By G. A. Boulenger.

[Received May 31, 1881.]

(Plates LXIII., LXIV.)

Thirty-five years have elapsed since Gray's 'Catalogue of Lizards' was published; and a great number of the species therein described still remain objects of difficulty to herpetologists. This is due chiefly to the shortness and ambiguity of Gray's diagnoses, which do not allow of the identification of his species, nor give an exact idea of their affinities.

With regard to the family Lacertidæ, no one has as yet attempted to make out the species enumerated in the 'Catalogue of Lizards.' Whilst engaged in naming some *Lacertæ* and *Acanthodactyli*, I recognized the necessity of going through all the species of these two genera; and I have the pleasure of laying before the Zoological Society the result of this work. Beside the species contained in Gray's Catalogue, I have also taken notice of those described since by Dr. Günther. This paper, therefore, is a critical account of all the species of *Lacerta* and *Acanthodactylus* represented in the British Museum.

I. Genus Lacerta, Linn.

As already observed by different authors, this genus has been divided in a most unnatural manner by Gray. It will not be necessary to discuss the characters of these so-called genera, the number of which amounts to five, viz. *Zootoca*, Wagl., *Lacerta*, L., *Thetia*, Gray, *Teira*, Gray, and *Nucras*, Gray. All these I consider to belong to one genus. *Notopholis*, Fitz., which by some is united with *Lacerta*, may, I think, be kept apart, and ought perhaps to be united with *Algira*, Cuv., as the recently discovered *Zerzoumia blanci*, Lataste [1], is a link connecting the two forms.

Zootoca oxycephala (Schleg.), Gray, Cat. p. 29.

The young specimen referred with doubt to this species proves to be *Lacerta muralis*. I have never seen an example of *L. oxycephala*; but Bedriaga, in his important paper [2], shows that it is doubtless perfectly distinct from *L. muralis*.

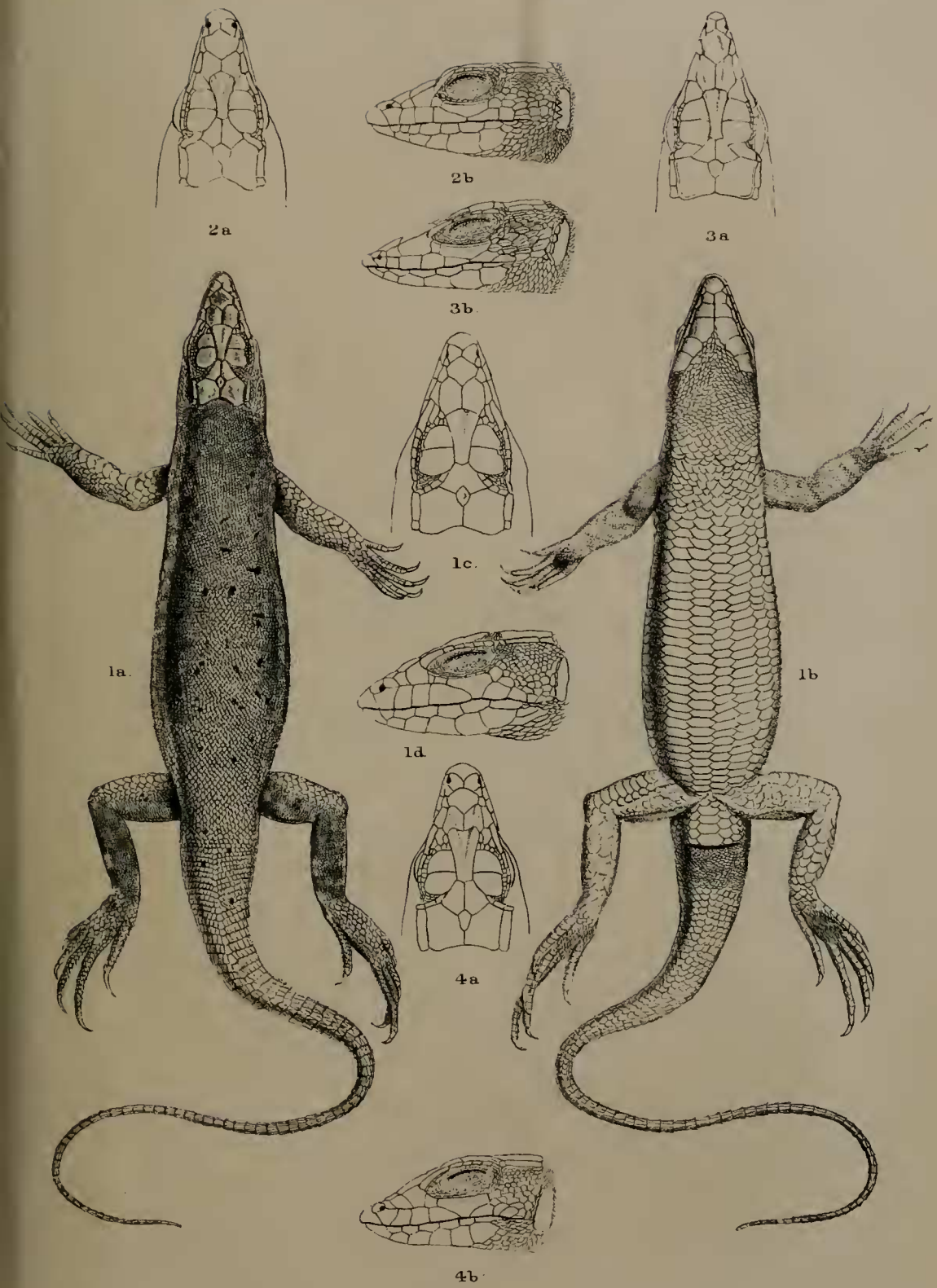
Zootoca taurica (Pall.), Gray, Cat. p. 29.

The British Museum did not possess this Lizard when the Catalogue was published. This species is now represented in the collection (3 ♀ s, Crimea). It bears great resemblance to *L. vivipara*. The scutellation of the temple is the same in both. The collar is decidedly toothed. The dorsal scales are granular, and perfectly smooth; three transverse series correspond to a ventral plate. The ventral plates are in six longitudinal series. The anal plate is surrounded by two series of small plates. Femoral pores 18. The free edge of the caudal scales is shortly pointed, the shape being thus intermediate between that of *L. vivipara* and that of *L. muralis*, var. *fusca*.

Zootoca derbiana, Gray, Cat. p. 29.

This species is identical with *Lacerta galloti*, D. & B., as had been recognized by my late friend Arthur O'Shaughnessy. This identification proves that the locality given with doubt "Australia? Sydney?" is, as might have been expected, the result of misinformation. It is perhaps hardly necessary to observe that the diagnosis given by Gray is, as usual, quite unreliable. First he states that there are 12 rows of ventral shields in *Z. derbiana*, 12 or 14 in *Z. galloti*; the fact is, that in this respect the forms do not differ from each other, the number of longitudinal series of plates being 12 or 14. Then the "minute granules between the dorsal scales," mentioned in *Z. derbiana* and not in *Z. galloti*, occur in both, and seem to be a specific character, which, however, can be ascertained only in specimens which have the skin somewhat distended. Finally it is stated that the middle series of ventral plates are the largest; it is the reverse.

[1] 'Le Naturaliste,' 1880, p. 299. [2] Arch. f. Naturg. 1880, p. 250, pl. xi.



Edwin Wilson del et lith

Mintern Bros. imp.

1. ACANTHODACTYLUS TRISTRAMI. 2. A. BOSKIANUS.
3. A. CANTORI. 4. A. VULGARIS

Zootoca deserti, Günther, P. Z. S. 1859, p. 470.

As has been supposed by Lataste [1], this species belongs to the genus *Acanthodactylus*.

Zootoca tristrami, Günther, P. Z. S. 1864, p. 491,

is likewise an *Acanthodactylus*.

Zootoca danfordi, Günther, P. Z. S. 1876, p. 818.

Doubts having been expressed by Bedriaga [2] as to the distinctness of *Podarcis judaica*, Camerano (=*Lacerta lævis*, Gray), from *Z. danfordi*, I think it useful to give a detailed description of the fine specimens in the British Museum. From this it will appear that the species are, without doubt, perfectly distinct from each other.

Shape and general proportions as in *L. muralis*, var. *neopolitana*, but the neck a little thicker, as broad as the head (in the adult *L. lævis* the neck is broader than the head). Postnasals 2, regularly superposed; upper labials 7 or 8, 5 before, and 2 or 3 behind the infraocular; 6 or 7 lower labials; 5 pairs of chin-shields, the 3 anterior in contact. The woodcut accompanying Günther's description represents the mental divided into two; this is a mistake, as not one out of the nine specimens shows any thing of the kind. Boettger [3] is therefore wrong when, judging from this drawing, he assigns 6 chin-shields to *L. danfordi*, and mentions this amongst the characters differentiating this Lizard from *L. judaica*. Temple covered with small granular scales, either without or with a very small masseteric plate (in *L. lævis* this plate is always present, and very large); a curved tympanic plate, similar to that of *L. muralis* and *L. lævis*. Occipital plate not broader than interparietal (broader than interparietal in *L. lævis*). The collar has its free edge even, and is formed of 9 or 10 plates. Dorsal scales round, granular, perfectly smooth, even on the hinder part of the back (hexagonal and distinctly keeled on the hinder part of the back in *L. lævis*); three transverse series correspond to a ventral plate. 23 to 27 pectoral plates. Six longitudinal and 24 to 27 transverse rows of ventral plates, the two central longitudinal rows narrower than the others; sometimes an additional series of smaller plates on each side (22 to 25 transverse rows in *L. lævis*). Anal plate small, much smaller than in *L. lævis*, surrounded by two rows of small plates. Femoral pores, 21–25 in ♂, 19–21 in ♀ (the specimens of *L. lævis* in the British Museum possess 20–21 in ♂, 16–17 in ♀). An important sexual character, which I have not met with in any other *Lacerta*, is the great dilatation, in the males, of two scales at the base of the tail at a short distance from the vent, similar to the sexual scales of many Iguanidæ. Scutellation of the tail as in *L. muralis* and *L. lævis*.

The coloration (in spirits) is also different from that of *L. muralis*, var. *fusca* and *L. lævis*, to both of which it bears, however, at first sight, great resemblance. Upper surface greenish brown. Head

[1] 'Le Naturaliste,' 1881, p. 358. [2] Arch. f. Naturg. 1879, p. 312.
[3] Ber. Senckenb. Ges. 1879–1880, p. 172.

spotted with black; a few black spots on the back; sides and limbs closely spotted with black. Females and young with more or less defined light spots, surrounded by a dark network. Lower surface greenish; throat more or less spotted with black: males with one or two black dots on each ventral shield, as in *L. stirpium*; these dots generally entirely absent in females. The spots on the lower surface and on the head are never met with in *L. lævis*.

Dimensions.	♂ metre.	♀[1] metre.
Total length	0·227	0·147
Length of head	0·019	0·013
Breadth of head	0·012	0·0085
Length of neck	0·011	0·009
Length of trunk	0·048	0·040
Length of fore limb	0·027	0·022
Length of hind limb	0·041	0·035
Length of tail	0·149	0·085

Lacerta lævis, Gray, Ann. N. H. i. (1838), p. 229, and Cat. p. 31; Günth. P. Z. S. 1864, p. 488.

This Lizard has been considered equivalent to *L. agilis* (*L. stirpium*) by Bedriaga and Boettger; the reason which induced them to take this view, I do not know. The type specimen is a female, bleached; in proportions and pholidosis it agrees perfectly with the recently described *Podarcis judaica*, Camerano[2]. The specimens from Palestine referred to by Günther are in good state, and the coloration agrees with that of *L. judaica* as described by Camerano, Bedriaga[3], and Boettger[4]. Consequently the name *judaica*, Camer. (1877), must be altered to that of *lævis*, Gray (1838).

Lacerta strigata, Eichw., Gray, Cat. p. 32.

L. viridis, L., Günth. P. Z. S. 1864, p. 488.

The British Museum possesses fine specimens of this form, which, in general appearance seems quite different from *L. viridis*. However, no important structural difference being noticeable, I think *L. strigata* must be considered merely a variety of *L. viridis*.

At present, 17 species of *Lacerta* appear to be perfectly characterized. In the following synopsis, I have endeavoured to facilitate their determination. I have used as a character the number of upper labials in front of the infraocular; but it must be observed that there may be accidentally one labial more or less. These irregularities occur very rarely, and generally only on one side; and as, in this difficult group, several specimens are, as a rule, required to name a lizard properly, I think this character will be of great help in distinguishing the species.

[1] Tail injured.
[2] Atti Ac. Sc. Torino, xiii. 1877, p. 92, pl. ii. figs. 2 & 5.
[3] Arch. f. Naturg. 1880, p. 270.
[4] Ber. Senckenb. Ges. 1879–1880, p. 172.

Synopsis of the Species of the genus Lacerta.

I. A single large plate on the anal region.
  1. Lower eyelid opaque.
    A. Collar distinctly toothed.
      a. Four anterior upper labials; a single postnasal.
        Dorsal scales hexagonal elongate, rather large, two series corresponding to a ventral plate ..... 1. *vivipara*, Jacq.
        Dorsal scales granular, small, three series corresponding to a ventral plate ..... 2. *taurica*, Pall.
      b. Four anterior upper labials; two postnasals.
        Postnasals not regularly superposed ..... 3. *stirpium*, Daud.
        Postnasals regularly superposed; occipital moderate; dorsal scales hexagonal elongate, keeled.. ..... 4. *viridis*, L.
        Postnasals regularly superposed; occipital large; dorsal scales oval, keeled ..... 5. *schreiberi*, Bedr.
        Postnasals regularly superposed; occipital large; dorsal scales granular ..... 6. *ocellata*, Daud.
    B. Collar even.
      a. Five anterior upper labials; two postnasals.
        Dorsal scales perfectly smooth; masseteric disk none; a single row of small plates surrounding the anal..... 7. *punctata*, Gray.
        Dorsal scales perfectly smooth; masseteric disk very small; 8–10 longitudinal rows of ventral plates ..... 8. *brandti*, De Fil.
        Dorsal scales perfectly smooth; masseteric disk none or very small; 6–8 longitudinal rows of ventral plates ..... 9. *danfordi*, Gthr.
        Dorsal scales keeled; masseteric disk large ..... 10. *lævis*, Gray.
      b. Four anterior upper labials; a single postnasal..... 11. *muralis*, Laur.
      c. Five anterior upper labials; a single postnasal.
        Ventral plates in 6 longitudinal series ... 12. *oxycephala*, Fitz.
        Ventral plates in 12–14 longitudinal series 13. *galloti*, D. & B.
  2. Lower eyelid transparent ..... 14. *perspicillata*, D. & B.

II. Two or more large plates on the anal region; occipital very small.
  Two postnasals; 8 longitudinal series of ventral plates .... 15. *delalandii*, M.-Edw.
  Two postnasals; 6 longitudinal series of ventral plates ..... 16. *tessellata*, Smith.
  A single postnasal; 6 longitudinal series of ventral plates..... 17. *tæniolata*, Smith.

Out of these 17 species, 3 are unrepresented in the British Museum, viz. *L. schreiberi*, *L. oxycephala*, and *L. brandti*.

II. Genus Acanthodactylus, Fitz.

Acanthodactylus bellii, Gray, Cat. p. 36.

As has been supposed by Strauch, Schreiber, and myself, this form is the young of *A. vulgaris*.

Acanthodactylus capensis, Smith, Ill. Zool. S. Afr. pl. 39; Gray, Cat. p. 37.

Two specimens, presented by Sir A. Smith, are in the British Museum. From these, I see that it is not an *Acanthodactylus*, but a *Scapteira*, as has been suspected by Dr. Peters [1]. I am also convinced that *Podarces* (*Scapteira*) *cuneirostris*, Strauch [2], is not specifically distinct from *A. capensis*.

Acanthodactylus savignyi (Aud.), Gray, Cat. p. 37.

This species is not the *Lacerta savignyi*, of Audouin, which I have not yet succeeded in identifying, but the same as that described as *Zootoca deserti* by Günther, and as *Acanthodactylus bedriagai* by Lataste. The name *deserti*, Gthr., though prior to that of *bedriagaæ*, must be cancelled, as there is a *Lacerta deserti*, Milne-Edwards, which is also an *Acanthodactylus*.

Acanthodactylus inornatus, Gray, Cat. p. 38.

Is identical with *A. scutellatus*.

I am acquainted with ten species of *Acanthodactylus*. Their synonymy and principal characters are as follows:—

1. Acanthodactylus scutellatus. (Plate LXIII. fig. 2.)

Lacerta scutellata, Aud. Descr. Egypte, Rept. (Suppl.) i. p. 172, pl. i. f. 7; M.-Edw. Ann. Sc. N. xvi. pp. 74 & 85, pl. vi. f. 3.

? *Lacerta olivieri*, Aud. *l. c.* p. 174, pl. i. fig. 11.

Lacerta dumerilii, M.-Edw. *l. c.* pp. 76 & 85, pl. vii. f. 9!

Scapteira inornata, Gray, Ann. Nat. Hist. i. p. 280.

Acanthodactylus scutellatus, Dum. and Bibr. Erp. Gén. v. p. 272; Gray, Cat. Liz. p. 37; Strauch, Mém. Ac. Sc. St. Pétersb. (7) iv. no. 7, p. 30; Bouleng. Bull. Soc. Zool. France, 1878, p. 185.

Photophilus scutellatus, Fitz. Syst. Rept. i. p. 20.

Acanthodactylus inornatus, Gray, Cat. Liz. p. 38.

Snout acutely pointed. Three palpebral shields. Infraocular not reaching the lip. Front edge of the ear strongly toothed [3]. Scales granular, smooth on the front part of the back, rhomboidal, keeled on the remaining part. Ventral plates not broader than long, in 14–16 longitudinal series. Præanal plates subequal. Digital denticulations very long.

Hab. North Africa; Senegal (Paris Mus.); Syria (British Mus.; Brussels Mus.).

2. Acanthodactylus boskianus. (Plate LXIV. fig. 2.)

Lacerta boskianus, Daud. Rept. iii. p. 188, pl. xxxvi. f. 2; Aud. loc. cit. p. 174, pl. i. f. 10.

Lacerta aspera, Aud. loc. cit. pl. i. f. 9.

Acanthodactylus boskianus (Fitz.), Wiegm. Herp. Mex. i. p. 10;

[1] Monatsb. Berl. Ac. 1869, p. 61.

[2] Bull. Ac. St. Pétersb. xii. (1867) p. 318.

[3] This character, however, in this and other species, is subject to a certain amount of variation, and must be used with caution.

Dum. & Bibr. loc. cit. p. 278; Gray, Cat. Liz. p. 38; Strauch, loc. cit. p. 38; Bouleng. loc. cit. p. 182.

Three or four palpebral shields. Infraocular not reaching the lip. Front edge of the ear strongly toothed. Dorsal scales very much larger on the hinder part of the back, imbricate, strongly keeled. Ventral plates broader than long, in 10–12 longitudinal rows. Digital denticulations very long.

Hab. N. Africa; Abyssinia, Arabia (British Mus.); Syria (British Mus.; Brussels Mus.).

3. Acanthodactylus cantori. (Plate LXIV. fig. 3).

Acanthodactylus cantori, Günth. Rept. Brit. Ind. p. 23; Stoliczka, Journ. As. Soc. 1872, pt. 2, p. 91; Blanf. E. Persia, Zool. p. 381.

This species resembles very much *A. boskianus*. The shape of the head is different, the snout being here longer and acutely pointed; the fronto-nasal and præfrontal shields are consequently more elongate. As a rule, there is a greater number of longitudinal rows of ventral plates, viz. 12–14. The front edge of the ear is never strongly toothed.

Hab. N.W. Hindostan; Baluchistan; Persia.

4. Acanthodactylus micropholis. (Plate LXIII. fig. 3.)

Acanthodactylus micropholis, Blanf. loc. cit. p. 283, pl. xxvi. f. 2.

Three or four palpebral shields, the front one frequently separated from the following by a row of granules. Infraocular generally forming part of the lip. Front edge of the ear slightly toothed. Dorsal scales granular on the neck and between the shoulders, larger, semioval, and sharply keeled on the rest of the back. Ventral shields broader than long, in 10–12 longitudinal rows. Digital denticulations not very long.

Hab. Baluchistan.

5. Acanthodactylus syriacus. (Plate LXIII. fig. 4.)

Acanthodactylus boskiana, var. *syriacus*, Boettger, Ber. Senck. Ges. 1878–79, p. 69.

Acanthodactylus savignyi, part., Boettger, Jahresb. Senck. Ges. 1879-80, p. 178 (specimens from Syria).

Four palpebral shields. Infraocular not reaching the lip. Temporal scales imbricate, keeled. Front edge of the ear slightly toothed. Dorsal scales slightly keeled on the neck and between the shoulders, larger, semioval and acutely keeled on the rest of the back. Ventral plates broader than long, in 10–12 longitudinal rows. Digital denticulations not very long.

This species is very closely allied to *A. micropholis*, from which it may be distinguished by the larger, imbricate, and keeled scales of the temporal region, and the more acute keel of the dorsal scales.

A. syriacus is known to me from the description of Boettger, and from one specimen collected in Palestine by Dr. Anderson.

Hab. Syria.